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Approved For Release 2001/11/19 : CIA-RDP78B04747A000400020004-2

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1047-67  
TCS-104-7  
Copy  
NPIC/TDS/D/6-1741  
28 December 1966

MEMORANDUM FOR THE RECORD

SUBJECT: The "Crop Yields" Program 997386

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On Aug. 2, 1965 [REDACTED] Chief/DD-I/Collection Guidance Staff wrote a memo to the Director, NPIC on the subject: Estimation of Acreages and Yields of Agricultural Crops from Overhead Photography. This memo stressed the importance, to the intelligence community, of knowing how well the Soviet Union and China are meeting their goals in agriculture. The memo asked whether aerial photography and photo-interpretation have a potential for developing new techniques that would be useful in estimating crop yields and acreages. The memo also asked whether automatic scanning procedures might be developed which would make the whole program feasible.

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On 1 Sept. 1965, [REDACTED] sent a memo back to the same office. In it he suggested that persons in DDI responsible for estimating acreage and yields of agricultural crops meet with NPIC's R&D people to review those portions of the current and planned research which appear to be even indirectly aligned with such problems. Following that meeting NPIC could take a more meaningful look at what could and should be done additionally in order to strengthen the effort for the benefit of DDI.

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A meeting took place in [REDACTED] office on 20 September 1965. [REDACTED] all from ORR. I was not present and I don't know exactly what was said or what took place.

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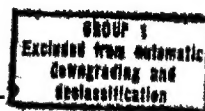
On Tuesday, 5 Oct. 1965, another meeting was held in the P&DS conference room with [REDACTED] and myself present. [REDACTED] prepared a memo for the record, dated 11 Oct 65, and titled "Discussion with NPIC officials on the Feasibility of Aerial Photography for Developing Estimating Procedures of Crop Production in the Sino-Soviet Bloc".

**Declass Review  
By NIMA/DOD**

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25X1A On Thursday afternoon, 21 October, I spent about an hour in  
25X1A [redacted] office 4G48 in the HQ bldg. [redacted] telephone ex-  
25X1A tension is [redacted]. He is in the Office of Research and Reports (ORR),  
Resources and Industries Division, Agriculture Branch (ORR/R/AG.).  
25X1A [redacted] particular group concerns itself with the estimating of crop  
productivity in the Sino-Soviet bloc. They utilize all types of data  
such as official Russian statistics (which often are not reliable),  
weather data (i.e., how many days of rain and how much sunshine, tem-  
perature data, etc. during the growing season) plus some additional  
information from reports filed by agricultural attaches, etc. Ap-  
parently all these sources leave something to be desired, especially  
when it comes to predicting the crop yield during the growing season.  
25X1A [redacted] and his colleagues have been wondering whether repeat orbital  
photo coverage acquired during the growing season might contain some  
sort of image or pattern or tonal clues which would give ORR/R/AG  
the missing extra crumb of information which would enable them to pre-  
dict crop yield during the growing season with enough accuracy to be  
useful. If such a research program ever gets under way at all, it  
most certainly will be a long-range program.

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25X1A If this program gets under way the ORR people want us (that is  
[redacted] or myself or someone from IAD) to do the analysis work.  
I'll have to admit that the idea is intriguing.

25X1A On 12 November 1965 [redacted] wrote me a Memo concerning the  
proposed project. Among other things he suggested that NPIC attempt  
to develop keys for the estimation of wheat yields in the selected  
areas, and to develop or refine techniques for crop identification  
and the estimation of sown acreage of specific crops. R/AG wanted  
25X1A us at NPIC to review [redacted] memo and then have another meeting to  
discuss the proposals and to initiate a coordinated effort to begin  
work on the proposed project.

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On Tuesday afternoon, Dec 7th, [redacted] and I had a conversation with [redacted] about the proposed program. Al [redacted]  
[redacted] Such coverage could be acquired from a U-2 over the crop areas of China with a minimum amount of risk from SAMs.

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He also told us that, with a sufficiently high priority rating from NRO, coverage over some previously designated spot such [redacted] could be obtained, but in the future this would be increasingly more difficult as there will be less and less film available for [redacted]

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On Thursday, 16 December 1965, another meeting was held in the P&DS conference room. Those present were [redacted] Chief, Resources and Industries Division of ORR; [redacted] Chief, Biological Sciences, ORD; [redacted] (of PAG); and [redacted] and myself from P&DS. Near the end of the meeting [redacted] also joined the group. There was a "useful exchange of views" among the participants. [redacted] gave us more details about the [redacted] low-altitude photo collection program being funded by ORD. This program is, however, pretty far away from what [redacted] office is talking about, in my opinion.

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As the meeting progressed it became fairly obvious that [redacted] had been "sold" the idea that some sort of automated, scanning microdensitometer technique could be developed, and when it had been developed, then KH-4 photography could be used to obtain the crop yield data they are seeking. One point brought out by [redacted] in our discussion of 7 Dec., however, was that the planned future use of the [redacted] Processor will make it more and more difficult to draw significant conclusions about surface areas (such as wheat fields under cultivation) on the basis of the density of these areas as they are imaged on the film record. Many of the others present at the meeting seemed equally convinced that the isodensitracer, or similar scanning microdensitometer equipment, does not offer much hope for the solution of the crop yield problems. Differences in film record density which were caused by factors such as varying sun angles, varying wind condition, etc. could also make it very difficult to draw meaningful conclusions from microdensitometer scan data. (In later discussions we found out that our "in-house" experts such as [redacted] were of the same opinion.)

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[REDACTED]

program could progress without interruption. If useful and applicable techniques were discovered through the study of simulated coverage then we could try to apply the findings to actual orbital photos.

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[REDACTED] and I were to discuss this farther and send our recommendations to [REDACTED]. If we concluded that an R&D plan is worth carrying out we should describe it in some detail and make specific recommendations as to who (what office, that is) is to be responsible for what tasks, etc.

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The ORR people still seem to expect us (that is [REDACTED] and me) to do a lot of, or possibly all of, the work since we are the Agency's R&D office in so far as photo interpretation is concerned, in their opinion. Our idea is to sub-contract the work-both the acquisition of simulated orbital photography and the analysis of the acquired photography. [REDACTED] did not seem to be prepared to have his office put up the money for any such contractor effort. It seemed as if ORR had always assumed that if an outside effort were contracted we would supply the money for it.

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On Jan 3rd 1966 [REDACTED] and I had a discussion on the subject: What are our (i.e., P&DS's) recommendations to ORR concerning the "Crop Yields" idea? Collectively we agreed that we did not support the idea of trying to use scanning microdensitometric techniques on KH-4-imagery to develop a method whereby it would be possible, ultimately, to predict crop yields in wheat growing areas. On the other hand, there was some support for the idea of having a systems-cleared contractor such as [REDACTED] do the following:

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[REDACTED]

2. Carry out an open-end analysis of this imagery in order to try to determine whether a detailed study of such imagery could give us the information needed to predict wheat crop yields.

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The concept of crop yield estimating got a shot in the arm when the USIB approved the following recommendation around the first of March 1966:

..."CIA will proceed apace in seeking to develop techniques which will enable estimates of crop yield to be made from satellite photography. . . (USIB-D-41.14/280, para 22.b)..."

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The forgoing was included in a note to the Director of NPIC from [REDACTED] USIB Support Assistant. In his reply of 28 March 1966, Mr. Lundahl said "...NPIC, however, has developed a design objective which will lead to a contract with external facilities for the study of this problem, the preparation of imagery interpretation keys on the subject and the development of interpretation techniques which make it possible to assess satellite photography acquired at regular intervals over specified croplands during the growing season for the purpose of estimating crop yields..."

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The Design Objective referred to by Mr. Lundahl was a Top Secret document dated 24 March 1966, a copy of which is in the job folder. A copy of this document was sent to [REDACTED] for ORR's evaluation. On 7 April 66 [REDACTED] stopped by in our office and told us that our Design Objective had been received with interest at ORR and that it was going up the chain of command.

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On 12 April 1966 [REDACTED] sent a memo to [REDACTED] stating that:

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1. ORR has reviewed the Design Objective--Estimating Crop Yields Through an Analysis of Orbital Reconnaissance Photography (TCS-2290-66). The Design Objective paper clearly states the intelligence problem and is an important step in carrying out the USIB recommendation that "CIA proceed apace in seeking to develop techniques which will enable estimates of crop yields to be made from satellite photography" (TCS-11051-66).

2. It is recommended that NPIC now ask appropriate contractors to submit proposals in response to this Design Objective.

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Action on this task slowed down to virtually a halt near the end of the Fiscal Year as all our attention was on getting approval for P&DS's big-budget prime-contractor programs.

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In June 1966 [REDACTED] ruled against the idea of our sending the Design Objective out to just a small number of Top Secret-cleared contractors. He wanted the document "sanitized" to the extent that it could be sent out to a relatively large number of new prospective contractors, especially to universities. I prepared a draft of the "sanitized" version on 20 June 1966.

More time slipped by, but by October the final version (classified CONFIDENTIAL) of the "sanitized" Design Objective was ready to be sent out to a list of about 18 potential bidders including 6 universities. The Logistics Security Staff then ruled that the document must be classified SECRET and that it could not be sent to any [REDACTED]

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The Request For Proposal No. RD-5-67 was finally sent out 27 October and replies were to be in 30 November.

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Early in November I talked with [REDACTED] of PAG [REDACTED] about the work he was doing for ORD. It is being done in conjunction with [REDACTED] and Ft. Detrick. [REDACTED] of California is doing the flying for this program.

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On 2 December I spent two hours at the [REDACTED] office getting more information about their program (being handled by [REDACTED] and I explained to him our proposed feasibility study.

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On 22 December a meeting took place in [REDACTED] office in the [REDACTED] of ORR and [REDACTED] and I were present, as were [REDACTED] of ORD. The meeting was called in order to try to determine whether the "Crop Yields" study we have received proposals on (in response to requirements levied on us by ORR) is unnecessary and overlapping in

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the light of the work already underway for ORD. Our (i.e., NPIC's) opinion is that the work need not duplicate the work being done by [REDACTED] for [REDACTED] shop since their program does not address itself to the usefulness of black-and-white [REDACTED] imagery. However, ORR must restate their interest and desires in this matter. [REDACTED] of ORR, is preparing this restatement, now and will send or bring it over to NPIC the first week in January.

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[REDACTED]  
Development Staff, TDS

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